

Abstract

Methane can be used as a source for producing hydrogen or hydrogen equivalents in a biological process using mesophilic or thermophilic bacteria of the order of the Thermotogales, e.g. *Thermotoga maritima*. Hydrogen can be produced as such, or as a reducing equivalent for the reduction of various compounds such as sulphur compounds. Especially, the methane oxidation can be used for anaerobically reducing sulphate to sulphide using methane as the predominant or sole electron donor, in coculture with sulphate-reducing micro-organisms.